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Using text messaging to support administrative communication in higher education

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ABSTRACT To be effective in higher education, text messaging must be effectively integrated into both the student and staff experience. These user groups provided input into the design of StudyLink, an email to text message service. A small-scale trial was conducted over a period of two academic terms to investigate the feasibility of using this system in a real educational setting. Students reported high satisfaction with the quantity and content of the text messages and tutors reported changes in behaviour that were directly attributable to the use of text messaging. Administrative staff members were able to integrate this service into their current means of communicating with students, though there were some difficulties in composing appropriate text messages. Students were able to effectively receive and act on text messages, but ambiguities introduced with sending text messages were not resolved.

KEYWORDS: *administration, mobile learning, mobile phone, SMS, text message*

Introduction

Mobile phone use in higher education

Mobile phones are nearly ubiquitous amongst young adults in the United Kingdom. Results from the Of tel Residential Survey indicate that 88 per cent of respondents between the ages of 15 and 34 owned or used a mobile phone in February 2003, up from 83 per cent in 2001 (Office for National Statistics, 2006). A survey conducted during the same month at the University of Dundee (2006) found that 96 per cent of student respondents owned a

mobile phone and 86 per cent had previously used the short message service (SMS), or text messaging as it is popularly known. Similar surveys conducted in the UK (Griffiths and Hmer, 2004), Norway (Divitini et al., 2002) and Japan (Dias, 2002; Thornton and Houser, 2004) confirm these findings of widespread use of mobile phones amongst young people in higher education.

SMS started off as a by-product of the mobile phone industry, and its rise in popularity surprised both technologists and sociologists (Faulkner and Culwin, 2005). SMS is now hugely popular, with a reported 3.2 billion text messages being sent in the UK during March 2006 alone (Text.it, 2006). In a study of 565 users, Faulkner and Culwin (2005) found that text messaging was used for a wide variety of activities and that it was even a preferred means of communication for some individuals. Harley (2006) discusses the use of text messaging as a means of maintaining social support networks. In a study of the use of text messaging and email for community development between co-located students on an Interactive Systems course, Longmate and Baber (2002) found that SMS was primarily used in an immediate manner to determine availability. It was more interactive than email, with many messages relating to previous conversations or meetings. The usage between students was both *expressive* (e.g. jokes, questions like 'how are you') and *instrumental* (e.g. co-ordinating group work) and served to consolidate their relationships.

Institutional provision of text messaging

There is wide scope for the institutional provision of text messaging in higher education. Garner et al. (2002) propose that 'SMS can be used to interact with people and influence their actions and understandings of situations' (2002: 16). Previously suggested uses of text messaging in higher education include: providing support, motivation and continuity; alerts and reminders (e.g. timetable changes, library loans); and delivering learning content and revision tips (Anderson and Blackwood, 2004; Naismith et al., 2004; Traxler, 2005). Previous trials have demonstrated that institutionally provided text messages can promote interactivity (Stone and Briggs, 2002; Markett et al., 2006) and that students welcome text messages that are perceived as timely, appropriate and personalized (Garner et al., 2002). Garner et al. (2002) also suggest that text messaging may promote involvement in a community of learners, thus encouraging the development of independent learners and reducing feelings of isolation through promoting community. Harley (2006) promotes the use of text messaging as a way to ease the transition into university life for first year students and also states that text messages should be used to prompt face-to-face and personal communications (Harley, 2005).

Integrating text messaging effectively

Scanlon and Issroff (2005) suggest that activity theory can form the basis for evaluating learning technology in higher education. Prior to reaching the evaluation stage, however, activity theory can also provide insight into how a text messaging service can be effectively integrated into the student and staff experience. Activity theory is based on the premise that in order to accomplish a desired outcome, a subject works on an object by employing tools. For example, a student (the subject) may be working on an essay (the object). She may employ a variety of tools, including reference materials on the topic of the essay, guidance notes from the tutor as to the expected format, pen and paper for jotting down notes and a word processing program for preparing the final text. The desired outcome may include both obtaining a passing grade and increasing her subject knowledge.

In the extended activity theory developed by Engeström (1987), the notion of community is introduced as the group who shares the same object. Rules mediate between subject and community and the division of labour mediates between object and community. External influences may change any of these activity components, causing imbalances, or contradictions, between them. Contradictions may be manifested as 'problems, ruptures, breakdowns, clashes' (Kuutti, 1996: 34). Taking the essay example further, the community can be viewed as the students, tutors and support staff who are involved in some way with composing or assessing the essay. The student would be expected to follow certain university policies and procedures when writing the essay, such as avoiding plagiarism (the rules). The division of labour would detail the assessment procedure for the essay. For example, the essay may have to be peer reviewed and revised before it is submitted to the tutor. If the student was required to submit her essay online, a possible contradiction might be the failure of the online submission system. This contradiction could be resolved by submitting a paper copy of the essay to the programme secretary.

According to Sharples et al. (2005), 'students are embedded in complex activity systems within the university and beyond' (2005: 139). In order to obtain the outcome of gaining a degree, they use a variety of tools to mediate the organization of their studies and 'participate in many overlapping communities with different rules and divisions of labour' (2005: 139). It is thus necessary to view the use of text messaging in the context of other communication sent by the institution. Students should be able to set their own rules about what information they receive, as mobile phones are personal tools (Divitini et al., 2002). Text messages are also associated with personal contact and, as such, 'careful consideration needs to be given to the human tone of the messages' (Stone and Briggs, 2003: 13). Excessive or unnecessary text messages may lead to a student perception of being monitored

(Garner et al., 2002), which may lead to 'spam-style deletion' (Griffiths and Hmer, 2004).

From the institutional perspective, Scanlon and Issroff (2005) point to a general contradiction in higher education of the 'student as a person to be educated versus student as source of revenue and profit' (2005: 433). Text messaging costs more than other methods of communication that are already provided by the institution (e.g. email), but has also been suggested as a means to address issues of student retention and satisfaction (Garner et al., 2002; Riordan and Traxler, 2003; Stone, 2004).

There are also contradictions in the tools used to send text messages. Previous implementations have required staff members to learn a new interface (see, for example, Mohammad and Norhayati, 2003; Harley, 2005). Griffiths and James (2005) integrated a text messaging service with a virtual learning environment (VLE) such that a text message could be sent in a similar way to sending an email. This implementation, however, introduced a different contradiction, as staff members now had to make an active decision about whether they wanted to send a particular message by email or by text.

Aim

The aim of this study was to investigate how a text messaging service could be better integrated within current staff and student activity systems as a means of providing administrative communication. In the context of this study, administrative communication includes notices of room changes and cancellations, notices of relevant lectures or other on-campus activities, details of assignment submission procedures and attendance matters.

Though it would not be possible to resolve the contradiction presented by the cost of sending text messages, the design of more appropriate tools could help to prevent the contradictions in the tools that were introduced by previous implementations. To do this, it was first necessary to obtain a better understanding of how staff and student users participate in the activity system of administrative communication.

Methodology

Target population

The International Foundation Programme (IFP) at the University of Birmingham is a pre-university (level 0) course consisting of full-time students from countries without a recognized equivalent to A-levels, the normal qualification for university study in the UK. The students tend to be quite young, and for many, this is their first time away from their home country. As the majority of IFP students are undertaking their academic studies in a second language, the programme is mainly focused around developing students'

capacities as independent, academic learners and supporting them through standardized tests of their English language proficiency.

The IFP student experience differs from that of other students at the University of Birmingham in a number of ways. The programme is delivered by the Centre for Lifelong Learning (CLL). Cohort sizes are typically less than twenty students, and consequently there are more opportunities for tutors to have individual contact with students. Each cohort has a dedicated programme secretary, who is responsible for communicating administrative information to the students. As the remainder of the CLL's courses are offered to part-time students during the evenings and weekends, there is little scope for the IFP students to interact with students from other programmes.

Study design

A variety of research methods were used to investigate the effective use of text messaging in higher education. This section presents the overall study design as a series of four stages: requirements analysis, design and implementation, user trial and user feedback. This organization, duplicated in the results section, has been adopted to clarify what data was gathered, as well as the specific details of the data collection procedures.

Stage 1: requirements analysis

A set of focus groups was conducted in May and June 2005 to explore student perceptions about the use of mobile phones for teaching and learning. Students from both the IFP and Bachelor of Philosophy in Professional Development (BPhil) programme were invited to participate in order to represent the diversity of programmes offered at the CLL. BPhil students are mature part-time students motivated mainly by career development prospects. Most of these students are currently in full-time work related to their field of study.

Three focus groups in total were conducted: the first with 13 BPhil students (10 female, 3 male); the second with two IFP students (1 female, 1 male); and the third with two additional IFP students (1 female, 1 male). At each focus group, two scenarios involving the use of text messaging for administrative communication were presented: one describing a student receiving a text message and the other describing a student sending a text message. After each scenario was presented, a series of questions on the topics of appropriate use, cost, access and user preferences were used to prompt informal discussion.

Stage 2: StudyLink design and implementation

StudyLink, an email to text message service, was designed as a means of sending text messages to students without having to change the current tools used by the administrative staff.

Users must register their email addresses with the service before they can send text messages and must register a mobile phone number before they can receive text messages. As illustrated in Figure 1, to send a text message, a registered user simply composes an email message, using a standard email program such as Microsoft Outlook, and includes a special email address in the 'Cc:' line. By including this special email address, the user is indicating that all of the recipients in the 'To:' line should receive both an email and a text message. Text messages can thus be sent to either individuals or groups, which is a necessary requirement according to Divitini et al. (2002). There are no restrictions on the number of recipients and it is not necessary to list a special email address for each user.

If the email address of a recipient matches with the mobile number of a registered user in the StudyLink database, the subject line of the email message is then sent as a text message. Otherwise, the email address is ignored, making it also possible to send the same email message to both registered and non-registered users, with only the registered users receiving the text message. Both text messages and emails are stored in a database for back-up.

Students can also send text messages from their mobile phones to a designated inbound number. The StudyLink application converts text messages received to the inbound number into email messages and sends them to a designated administrative staff member.

Stage 3: user trial

A trial of the StudyLink service was initiated with the IFP students at the beginning of the Autumn academic term in September 2005 and continued

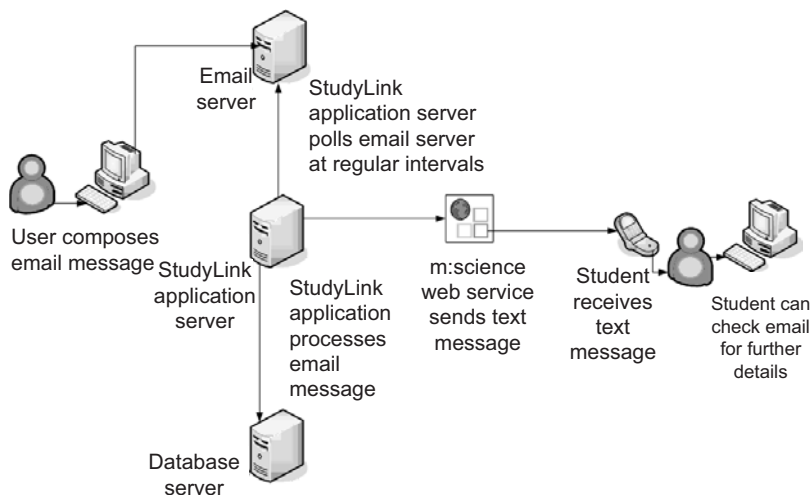


Figure 1 Sending a text message to a student

through to the end of the Winter academic term in March 2006. There were a total of 13 (5 female, 8 male) students in the IFP cohort in the 2005/2006 academic year. Ten of these students were registered as IFP Humanities and Social Sciences students, while three were registered as IFP Science students. Most students (8) arrived in the UK from China. The home countries of the other students included: Taiwan (1); Korea (1); Turkey (1); Russia (1); and Trinidad and Tobago (1). English was a second language for all but one of the students.

IFP students had regular contact with seven different tutors over the course of the trial and were administered by two programme secretaries (one in the Autumn and one in the Winter).

Participation in the trial was completely voluntary. Students were required to indicate their consent to participate in the trial by signing a consent form and providing a UK-based mobile phone number. As all text messages would also be sent through email, students who chose not to participate would still be able to receive important administrative notices.

Eight out of the 13 students (7 Humanities, 1 Science) registered for this system. This is a very small number of students, and as such results from this trial cannot be considered to be generalizable across student groups. Their feedback can, however, provide useful insights into the feasibility and appropriateness of using text messaging in a higher education context.

Stage 4: user feedback

Feedback sessions were held with the IFP students at the end of both the Autumn and Winter terms. Six students attended the Autumn session and completed a questionnaire. An identical questionnaire distributed by email to the remaining students received three responses. Of the nine students, three had not chosen to participate in the StudyLink trial. Their reasons for this included: lack of a mobile phone (1), not understanding that it was necessary to actively provide consent and a mobile phone number (1) and thinking that the university might send too many messages (1).

Seven students attended the Winter session and completed a similar questionnaire. Of the seven students, two had not chosen to participate in the StudyLink trial. Their reasons included not being comfortable sending and receiving text messages (1) and thinking that the university might send too many messages (1). One student felt that he had missed the registration deadline and was too late to participate.

An informal 30 minute interview was conducted with the designated programme secretary at the end of each term. An online questionnaire was sent to the eleven tutors and programme coordinators involved with the trial at the end of the Autumn term. Only two responses were received. Four tutors responded to an email questionnaire distributed at the end of the Winter academic term.

Though they were all registered users, none of the tutors used the StudyLink service directly to send text messages. Four of the seven used it indirectly by requesting one of the programme secretaries to send out text messages on their behalf.

Results

Stage 1: requirements analysis

Both the BPhil and IFP groups felt that text messaging is desirable to communicate information that is:

time-sensitive: information should require action or directly affect the student's activities within the next 48 hours.

relevant: information should be directly relevant to student's activities (e.g. my lecture, my appointment, my library books).

unambiguous: information should clearly indicate required actions (if any) on the part of the student.

selective: a volume of 3–5 messages per week was deemed acceptable.

trustworthy: messages should originate from a single contact person, who is known to the students.

The IFP group stated that they would also like to see text messaging used for:

- reminders of assignment due dates;
- reminders of application due dates;
- notification of exam results and individual feedback on assignments.

Examples from the students of appropriate text messages included notification of:

- lecture cancellations or room changes;
- unplanned facility shutdowns (e.g. computer labs);
- library books that are coming due or overdue;
- reserved library books that have become available;
- details for individual appointments with tutors, including both scheduling and rescheduling.

Students felt strongly that fee payment reminders were inappropriate to send as text messages and most also thought it was an inappropriate means to communicate information about social events. They were slightly wary that this type of system might be used to bombard them with advertising for campus-based services.

Students thought that text messaging was the most effective means of ensuring information gets out to everyone, but in order to ensure receipt,

they preferred all information sent by text messaging to also be sent by email, echoing the findings of Garner et al. (2002), where 79 per cent of students wanted an email back-up.

Students strongly agreed that these services should be provided to them free of charge, which has also been reported by Stone (2004) and by Griffiths and Hmer (2004). They were particularly supportive of an advertising based system in which a portion of the message would contain advertising information, with the proviso that their mobile phone numbers not be shared or sold directly to advertisers.

With respect to a system that allowed them to send queries by text message, the BPhil students felt they would use such a system sparingly, while IFP students would use it regularly for a range of questions, similar to the findings of Divitini et al. (2002).

Stage 2: StudyLink design and implementation

The StudyLink text messaging service was implemented as a C# web application. A free SMS web service from m:science Ltd (www.m-science.com) was used to send and receive the text messages. The text messages were purchased in bulk from the same company, as was the inbound number that would receive text messages from students.

Stage 3: user trial

Quantity and distribution of text messages

A total of 94 email messages were sent to the special email address, 28 in the Autumn term and 66 in the Winter term. Most of the email messages were addressed to multiple recipients, resulting in an overall total of 418 text messages. This represents an average of 52 text messages per student over the two terms.

In addition to the increase in the number of emails in the Winter term, the subject lines in 20 per cent (13) of the 66 emails exceeded the 160 character limit of a text message and had to be delivered as two messages. This increased the total number of text messages by 52 from 239 to 291.

An additional eight confirmation of registration messages were sent by the system administrator, for a total of 426 text messages over the two terms. In contrast, only two text messages were received from students; one in the Autumn term and one in the Winter term. The students did, however, continue to communicate with their tutors and programme secretaries by email.

Classification of text message content

Garner et al. (2002) propose the following types of text messages: course information, emergency and prompt, while Harley (2005) classifies messages into organizational matters, general messages and individual messages. Riordan and Traxler (2005) use five message types: urgent admin,

such as room changes; general reminders, e.g. coursework deadlines; teaching materials such as revision tips; individual feedback on coursework; and individual admin such as appointments. In this study, five types of text messages were determined from user suggestions: room changes/class cancellations; reminders to submit assignments; reminders to collect assignments; notices of relevant lectures/activities; and individual administration. A review of text messages after the trial revealed the need for two additional types: instructional messages and thank you messages. The type 'Room changes and class cancellations' was also generalized into 'Notices of changes and cancellations' in order to incorporate timetable changes.

Table 1 presents a distribution of messages by type as well as providing an example of an actual text messages sent during the trial. Note that names and contact information have been replaced with '***'.

Table 1 Distribution of messages by type

<i>Message type</i>	<i>Example message</i>	<i>Number of email messages</i>	<i>Number of text messages</i>
Notices of changes and cancellations	From ***: Your class with *** is cancelled this Thursday.The next meeting will be 16 March when you will deliver your group presentations	8	53
Reminders to submit assignments	From ***: Pl. submit Econ Ass. 4	11	37
Reminders to collect assignments	From ***: Pl. collect yr English texts from yr pigeonhole	12	34
Notices of relevant lectures/activities	From ***: Reminder: ISAS Talk, FRIDAY 21 OCT, 10.45 A.M. RM G.04	31	223
Individual administration	From ***: Please contact ***, *** to explain why you are not attending his course: History of Scientific Ideas in Western Culture	17	21
Instructional messages	From ***: When submitting assignments a hard copy must be handed in as well as emailing a copy to ***	7	40
Thank you messages	From ***: Thank you very much to those students who attended the meeting with *** on Thursday ***	3	10

Stage 4: user feedback

Students

In response to the questionnaire distributed at the end of the Autumn term, five of the six participating students thought the number of messages received was 'About right', whilst the other student thought the number of messages received was 'Too low'. Seven of the nine respondents said they would subscribe to the service if it was offered for an additional term, with one being undecided and one not providing a response.

At the end of the Winter term, all five of participating students thought the number of messages received was 'About right'. They also claimed that though the messages were sent both by text and by email, they always noticed the text message first.

The students perceived all of the messages as containing useful content. Some classes of messages, including room changes/class cancellations, reminders to submit assignments and individual administration messages were deemed to be 'Very Useful' by the majority of students in both the Autumn and Winter terms. Students also made several supportive comments about the service, including: 'texts are really on time' (Autumn); 'they do great, just keep going' (Autumn); and 'This service is superb!' (Winter).

When the students were questioned about their attitude towards sending text messages, there was a general consensus that they would rather communicate by email when sending queries. They felt that email was a better tool to ensure that they were understood, and to keep a record of their communications.

Administrative staff

Both programme secretaries noted that the StudyLink service was easy to use and to integrate with their normal working practices. They felt that many students didn't check their email regularly, and that this type of service was a way to ensure that information was delivered and thus to protect against possible appeals. One of the programme secretaries felt that, overall, text messages were more reliable than email. They speculated that some of the tutors might not have realized the benefits of contacting students by text message, and thus did not provide them with information in a timely manner.

Academic staff

In response to the Autumn term questionnaire, one respondent stated that he did not see a need to contact the students by text message, while the other stated that she did not have a mobile phone or 'do text messaging'. The latter respondent commented that she thought it should be up to the programme secretary to decide if a message was appropriate to send through StudyLink. With respect to the perceived impact of the system, one of the respondents

commented that she thought the students had generally been better at attending lectures and other events, but that this could be due to a variety of factors.

In response to the Winter term questionnaire, the four tutors who sent text messages through the programme secretaries felt it to be effective: 'I am convinced of its value as a means of communication' (Tutor 1); 'the system is reliable. Students get the messages and respond accordingly' (Tutor 3); 'the messages got through and were acted upon' (Tutor 4). They saw the main strength of text messaging to be its ability to reach the students anywhere: 'not all students have easy access to computers at all times but do look at their phones constantly' (Tutor 2); 'it's a marvellous tool for speedily contacting students' (Tutor 3).

Three of the four tutors felt that text messages should be used mainly for important messages including timetable or room changes, and important reminders about assessments, though one tutor commented that he used the service 'fairly indiscriminately in the end, as the students were so accepting of it. In other words, every email I sent had a text message reminder' (Tutor 3). One of the tutors used text messages exclusively for group reminders, while the others also found it useful for individual administration: 'A student who had been out of contact and had serious problems with assessments not received or failed, received a call for an urgent personal tutorial and attended for advice in time to alert them to the implications of this' (Tutor 2); 'I used the service both for general reminders, and for specific requests for students to contact me' (Tutor 3).

While the tutors did not observe any negative impact of this service on student behaviour, they noted that the voluntary nature of the service meant that not all of the students would get the urgent messages and that there was a danger of bombarding students with text message communication.

Conclusions

Students participate in a variety of overlapping activity systems, both inside and outside of their institutions. In order for text messaging to fit into these activity systems, they must communicate information that is time-sensitive, relevant, unambiguous, selective and trustworthy. Following a two term trial of StudyLink, an email to text message service, students reported high levels of satisfaction with both the quantity and content of the 418 text messages sent. Notices of relevant lectures/activities were the most popular type of message, though individual administration messages were cited by the tutors as being particularly effective.

StudyLink was an effective tool for communicating with students, as it joined two of the students' current activity systems – receiving emails and receiving text messages. Students clearly linked receiving a text message to

taking appropriate action, a rule that had perhaps developed from text messaging in other contexts. It was also clear that the students expected text messaging to be provided in addition to, rather than substitute for, the communication that they normally received by email. The students also were not able to resolve the contradiction that text messaging presented in their ability to communicate information back to the institution, and instead continued to rely on email. This was somewhat surprising, as previous authors have suggested that text messages should be used as a two-way form of communication (see, for example, Divitini et al., 2002; Griffiths and James, 2005) and the previous IFP cohort had indicated they would use such a service for a variety of queries. The expressed need from this cohort to ensure that they were understood may be related to their insecurity communicating in a second language.

In the activity system of communicating administrative information to students, the programme secretary is the subject and the message to be communicated to the student is the object. The desired outcome is to deliver the message in a timely manner, such that it can be acted upon appropriately. For the programme secretaries, email was already the established tool for mediating this activity. The StudyLink service allowed them to use the same tool to send both text messages and emails. It was necessary to implement different rules, such as placing all pertinent information in the subject line. Some contradictions were introduced, as evidenced by the proportion of messages that exceeded the 160 character limit. As long messages were handled internally by the system, it is entirely possible that the programme secretaries were not even aware of this issue. Simply bringing it to their attention may resolve the contradiction, as the programme secretaries were quite receptive to the use of this service. One of the two programme secretaries even showed a willingness to experiment with the informality of text messaging (e.g. omitting vowels), which Harley (2005) suggests is important for making students feel at ease.

None of the seven tutors sent text messages directly, though four of them sent text messages indirectly by specifically asking one of the programme secretaries to send text messages for them. The programme secretaries had a lot of autonomy in how they communicated with students, and it is likely that they sent out some text messages on behalf of the other tutors as well. This apparent lack of ownership amongst the academic staff is likely more reflective of the established division of labour within the CLL, rather than of their views on the use of text messaging.

After the initial information session and registration period, there was a perception from both staff and students that it was difficult to add students to the system, when in fact this could be done quite easily by the system administrator. This represents a contradiction in the element of division of labour.

A similar experience was encountered when students wanted to change their mobile phone numbers, also reported as an issue in Garner et al. (2002).

Limitations

While this study has demonstrated how a text messaging service can be effectively integrated into the activity systems of staff and students, it must be noted that it involved a very small number of students whose academic experience is unconventional. While the preferences of the students towards the types of text messages they would like to receive is broadly in line with the existing literature, the response from other student groups may differ.

The design of StudyLink assumes that email is the primary tool for administrative communication. Institutions that rely on other means of communication, such as face-to-face sessions or notice boards may experience resistance from staff towards changing their working practices.

For the user trial, the costs of the text messages were absorbed by the project budget. This may have resulted in the administrative staff sending more text messages than they would have if their centre was required to cover the costs.

Future research

There is a need for larger-scale trials across mainstream academic programmes, with proportionally smaller numbers of support staff, to further investigate the contradictions that administrative text messaging introduces into the activity systems of both staff and students. In particular, contradictions relating to the cost of text messaging need to be considered carefully, as the benefits of student satisfaction and promoting changes in behaviour are not directly quantifiable.

Further work is also needed to formalize the rules for informal, technology-mediated communication. Harley (2006) notes that text messages sent en masse are still received as if they were personal communications, which can be used to foster a set of belonging to the university community, but there is a danger of impinging on students' social spaces (Sharples et al., 2005). It is also conceivable that services like StudyLink could create a further contradiction in the rules of responding to administrative communication, as students could become dependent on the service and not take any action in the absence of a text message reminder.

Further developments also need to take into account the ability for end users to execute management tasks such as registration and updating contact details.

Implications

The use of text messaging and the design principles underlying StudyLink can be applied to a variety of situations in higher education. Text messages

can reach students anywhere, and can save them significant amounts of travel time and frustration when changes or cancellations occur at the last minute. Students clearly associate text messages with taking action, and as such they can be used to prompt desired behaviour, such as attending lectures or turning in assignments on time. Individually addressed messages can be particularly effective in reaching students who may not be communicating through other channels. When used as polite reminders and thank you messages, text messages can promote a 'culture of niceties' (Griffiths and James, 2005), and can be one way of addressing issues of student retention and satisfaction.

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